Avlite®
www.avlite.com

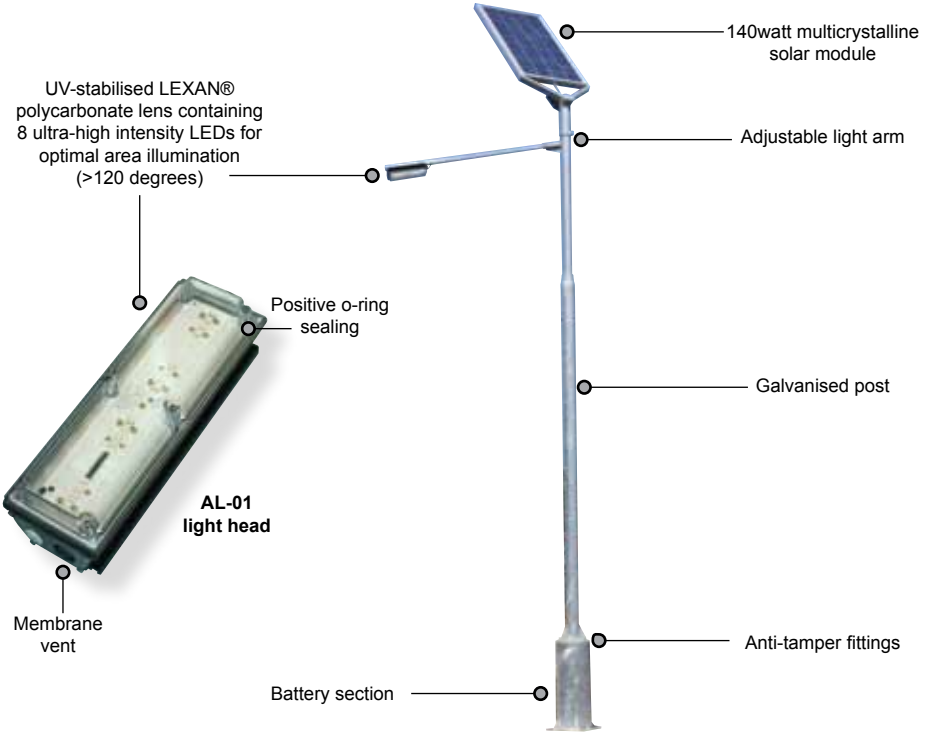
AV-SAL-01

Solar Area Light
Installation & Service Manual

Version 2.1

Avlite
www.avlite.com

AV-SAL-01
Solar Area Light


140watt multicrystalline solar module
Adjustable light arm
UV-stabilised LEXAN® polycarbonate lens containing 8 ultra-high intensity LEDs for optimal area illumination (>120 degrees)
Positive o-ring sealing
Galvanised post
AL-01 light head
Membrane vent
Anti-tamper fittings
Battery section

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Version No.	Description	Date	Approved
1.0	Manual launch	August 2010	M. Henry
2.0	Product Code change	October 2012	J. Dore
2.1	Spec table update	January 2013	J. Dore

Introduction

Congratulations! By choosing to purchase an Avlite light, you have become the owner of one of the most advanced solar LED airfield lights in the world.

Avlite Systems draws on more than 25 years experience in the design and manufacture of navigation aids, and particular care has been taken to ensure your light gives years of trouble free service.

As a commitment to producing the highest quality products for our customers, Avlite has been independently certified as complying with the requirements of ISO 9001:2000 quality management system.

By taking a few moments to browse through this booklet, you will become familiar with the versatility of your light, and be able to maximise its operating function.

Please remember to complete the Avlite warranty registration card accompanying your light.

Operating Principle

The solar module of the light converts sunlight to an electrical current that is used to charge the battery. The battery provides power to operate the light at night.

The flasher unit has very low current requirements. A microprocessor drives an array of ultra bright LED's through a DC/DC converter, which enables the LED's to operate within the manufacturer's specifications. The battery is protected from over-charging within the circuit to ensure maximum battery life.

On darkness, the microprocessor will initiate a program check and after approximately 1 minute will turn on.

Technology

Avlite Systems is a world-class solar lighting systems manufacturer with a proven reputation for rapid, innovative, and agile technology solutions designed specifically for defense, government, civil and humanitarian aid operations in the most remote, toughest environments.

Electronics

Avlite employs leading in-house electronic engineers in the design and development of software and related circuitry. All individual electronic components are sourced directly by Avlite procurement staff ensuring that only the highest quality components are used in our products.

LED Technology

All aviation lights use the latest advancements in LED (Light Emitting Diode) technology as a light source. The major advantage of LED's over traditional light sources is well established in that they typically have an operational life in excess of 100,000 hours, resulting in substantial savings to maintenance and servicing costs.

Precision Construction

Commitment to investing in the design and construction of injection-moulded parts including optic lenses, light bases and a range of other components ensures that all Avlite products are of a consistent and superior quality.

Optical Performance

Avlite manufactures a range of aviation LED lenses moulded from multi-cavity dies. Complex shapes such as the AV70 and 16-segment multi-focus lenses are a testament to the company's superior in-house lens manufacturing capabilities and outstanding optical performance.

Award-winning, Patented Technology

Several United States and Australian patent registrations are held on Avlite's range of innovative designs, with other regional patents pending in Canada, United Kingdom and Europe.

AV-SAL-01 Model

Avlite's state-of-the-art Solar Area Light provides users with the perfect solution for lighting remote locations such as shelters, car parks and maintenance areas where connection to power grids is unfeasible.

The assembly uses the latest technologies in Light Emitting Diodes (LEDs) as a light source, and provides excellent illumination over a wide projected area.

As well as the Solar Powered Unit, Avlite's LED Area Light is also available as a mains powered version, providing installation flexibility.

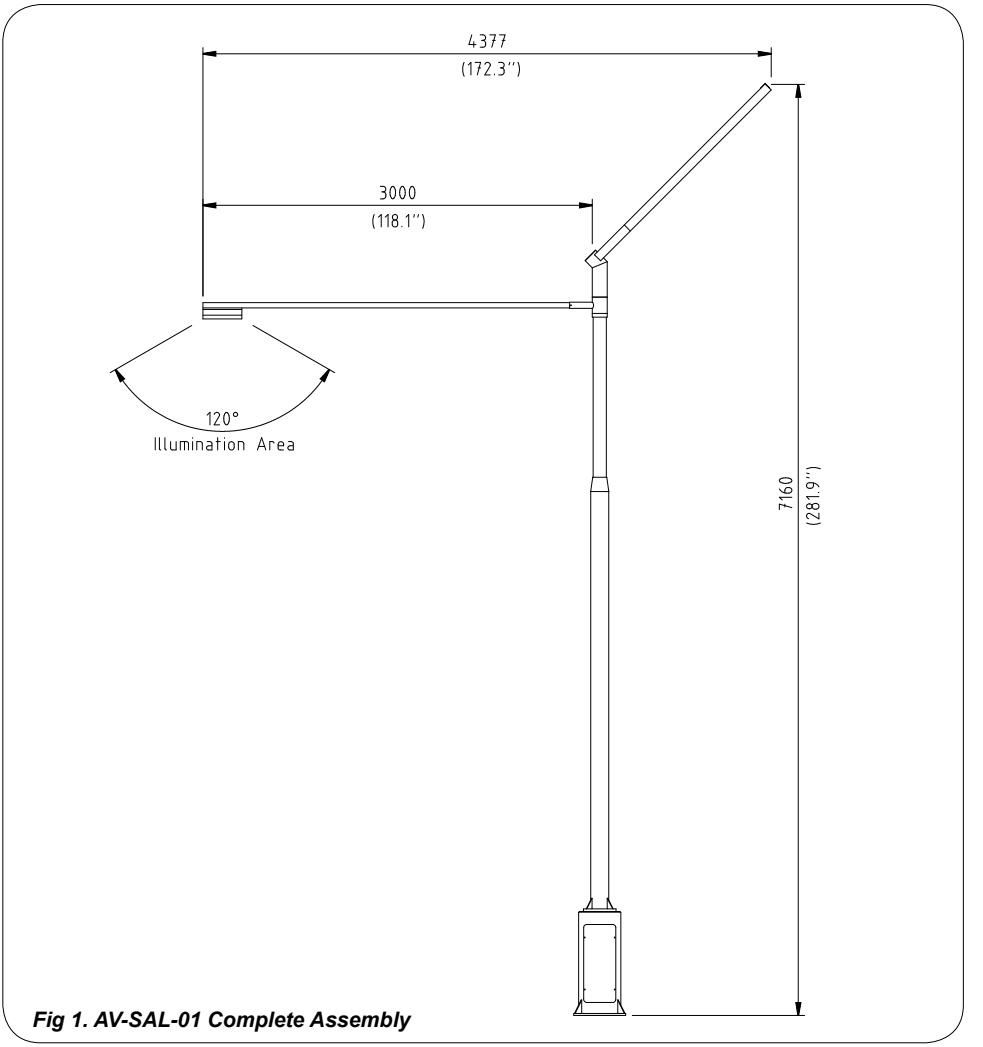


Fig 1. AV-SAL-01 Complete Assembly

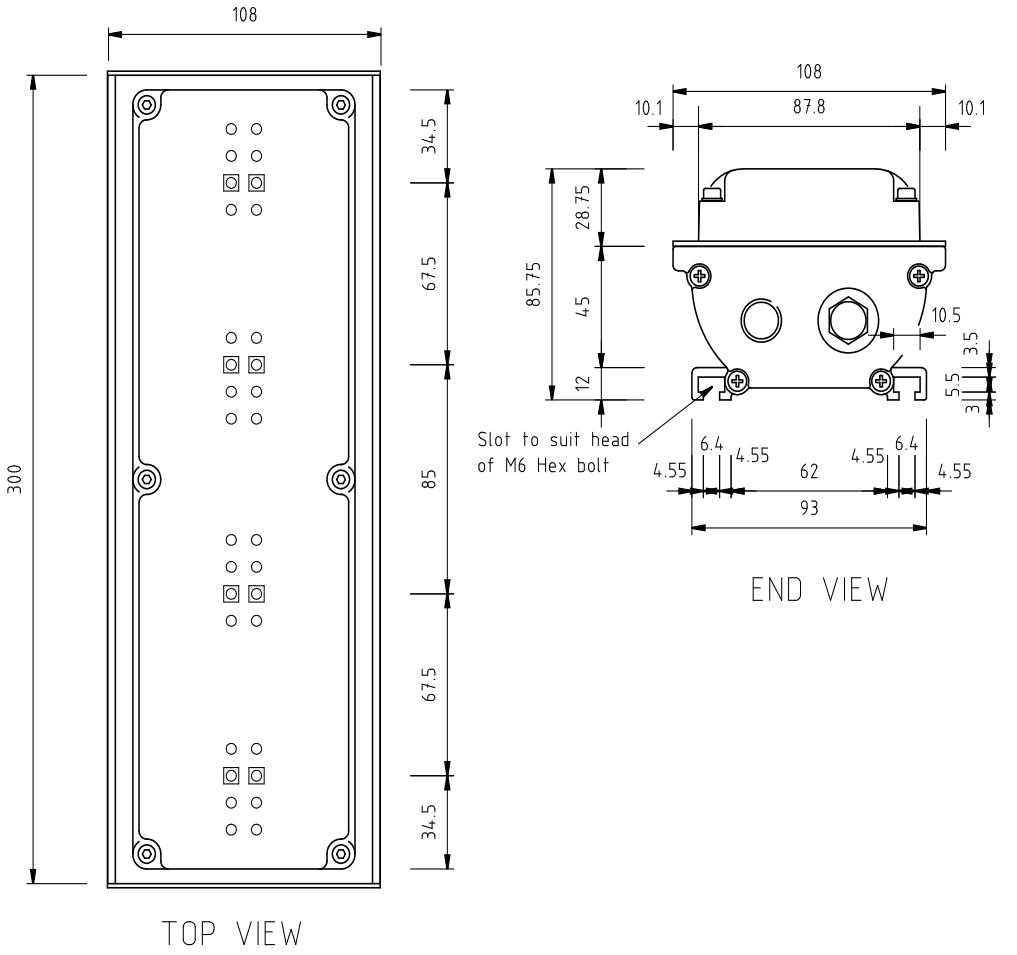


Fig 2. AL-01 Light Head

SPECIFICATIONS • *	AV-SAL-01
Light Characteristics	
Light Source	8 ultra-high intensity white (warm daylight) LEDs
LED Life Expectancy (hours)	>50,000
Photometry	
Total Luminous Flux (lm)	1360
Luminous Efficiacy (lm/W)	69.7
Electrical Characteristics	
Voltage (V)	12
Current (A)	1.7
Power (W)	20
Power Factor	1.0
Circuit Protection	Integrated
Temperature Range	-40 to 55°C
Spectral Characteristics	
CIE 1931 2 deg observer (x,y) (1)	(0.312, 0.336)
CIE 1976 2 deg observer (u',v') (1)	(0.195, 0.472)
Correlated Color Temperature(1)	6500 K
Color Rendering Index(1)	71
Color Spatial Uniformity(2)	0.0207
Solar Characteristics	
Solar Module Type	Multicrystalline
Output (watts)	140W
Solar Module Efficiency (%)	14
Charging Regulation	Integrated charge regulator
Power Supply	
Battery Type	SLA (Sealed Lead Acid)
Battery Capacity (Ah)	110Ah (2 x 55Ah batteries)
Nominal Voltage (V)	12
Operation without sunlight (autonomy nights)	5 night (typical)
Physical Characteristics	
Body Material (light head)	Extruded aluminium chassis with LEXAN® polycarbonate glass filled end caps - UV-stabilised
Lens Material (light head)	LEXAN® Polycarbonate – UV stabilized
Mounting (light head)	Adjustable along 78mm parallel channels
Height (light head) (mm/inches)	85 / $3^{3}/_{8}$
Width (light head) (mm/inches)	108 / $4^{1}/_{4}$
Length (light head) (mm/inches)	300 / $11^{7}/_{8}$
Mass (light head) (kg/lbs)	1.5 / 3.3
Body Material (post)	Mild steel (hot-dipped galvanised)
Mounting (post)	4 x 22mm holes
Height (complete assembly) (mm/inches)	7160 / $281^{7}/_{8}$
Mass (complete assembly) (kg/lbs)	250 / 551
Product Life Expectancy	Up to 12 years
Certifications	
CE	EN61000-6-3:1997. EN61000-6-1:1997
Quality Assurance	ISO9001:2008
Intellectual Property	
Trademarks	AVLITE® is a registered trademark of Avlite Systems
Warranty *	3 year warranty
Options Available	• Radio controlled • Avlite Pilot Activated Lighting Control • Dual arm assembly

• Specifications subject to change or variation without notice
* Subject to standard terms and conditions
(1) Value is computed from the weighted average of the spatial measurements
(2) Value is the maximum deviation of the spatial u' and v' measurements from the weighted average

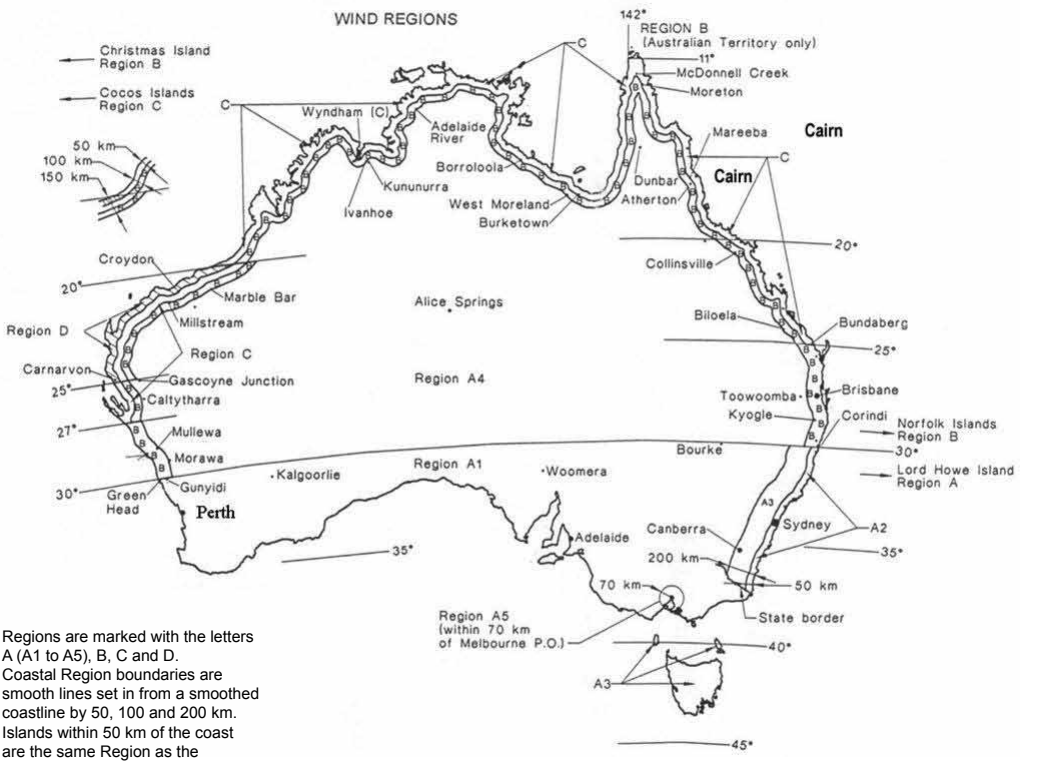
CE

Installation & Assembly

Wind Loading

Avlite Systems' panel mounting post is designed to meet wind loading requirements of AS1170.2 for Region A, B & C, Terrain Category 2 in accordance with the design requirements of AS4676.

For detailed information regarding wind load regions and wind loading in general refer to AS1170.2.



Regions are marked with the letters A (A1 to A5), B, C and D. Coastal Region boundaries are smooth lines set in from a smoothed coastline by 50, 100 and 200 km. Islands within 50 km of the coast are the same Region as the adjacent coast.

	BASIC WIND SPEEDS IN DIFFERENT REGIONS			
	Regions	serviceability V_s (m/s)	permissible limit V_p (m/s)	ultimate V_u (m/s)
Normal	A	38	41	50
Intermediate	B	38	49	60
Cyclonic	C	45	57	70
Severe Cyclonic	D	50	69	85

Fig 3. Wind Speeds - Regions A, B, C & D

Region A

Region A covers most of Central and Southern Australia, including Tasmania.

1. Assembly of the lamp post is shown in Figure 5.
2. Electrical wiring of the Solar Area Light is shown in Figure 6.
3. Recommendations for mounting of the completed lamp post assembly are shown in Figure 4.
4. Where the customer is providing their own supporting structure for the lamp post, it should be capable of withstanding the following design conditions:
   - Provide adequate support for a dead weight of 250kg
   - Ultimate moment at base = 21 kNm
   - Ultimate shear at base = 5.3 kN
   - Resulting ultimate bolt load = ±46 kN
5. A purpose-built footing is otherwise recommended with dimensions shown in Figure 3. Footing design is based on typical soil having a bearing strength of 120kpa or greater. If the soil is poor, variable or rock then seek additional engineering advice.
6. a) Use a simple template with diameter 20mm holes drilled at 320mm centres to position the holding bolts while the concrete is poured and while it sets. (Position the bolt pattern to suit the preferred location for the access cover in the lamp base).

   b) Remove the top nuts and the template after setting.

   c) Fit the assembled lamp post over the hold down bolts with the base sitting directly on the bottom nuts.

   d) Adjust bottom nuts to level the post base.

   e) Fit a washer and two nuts to each of the hold down bolts to securely fix the lamp post base.

References:
AS1170.2 “Structural design actions - wind actions”
AS4676 “Structural design requirements for utility services poles”

Region B, C & D

Please contact Avlite Systems for recommendations.

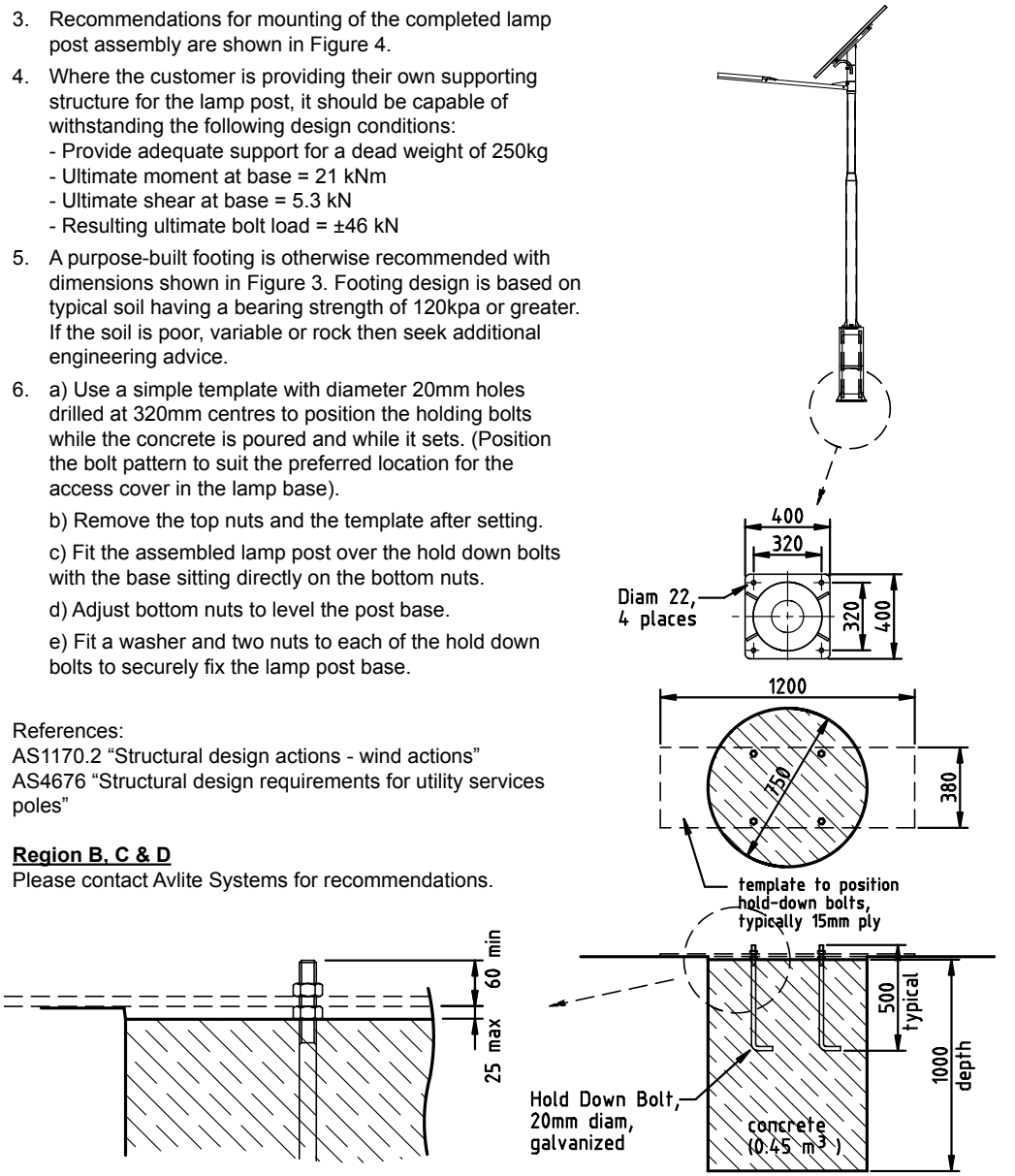
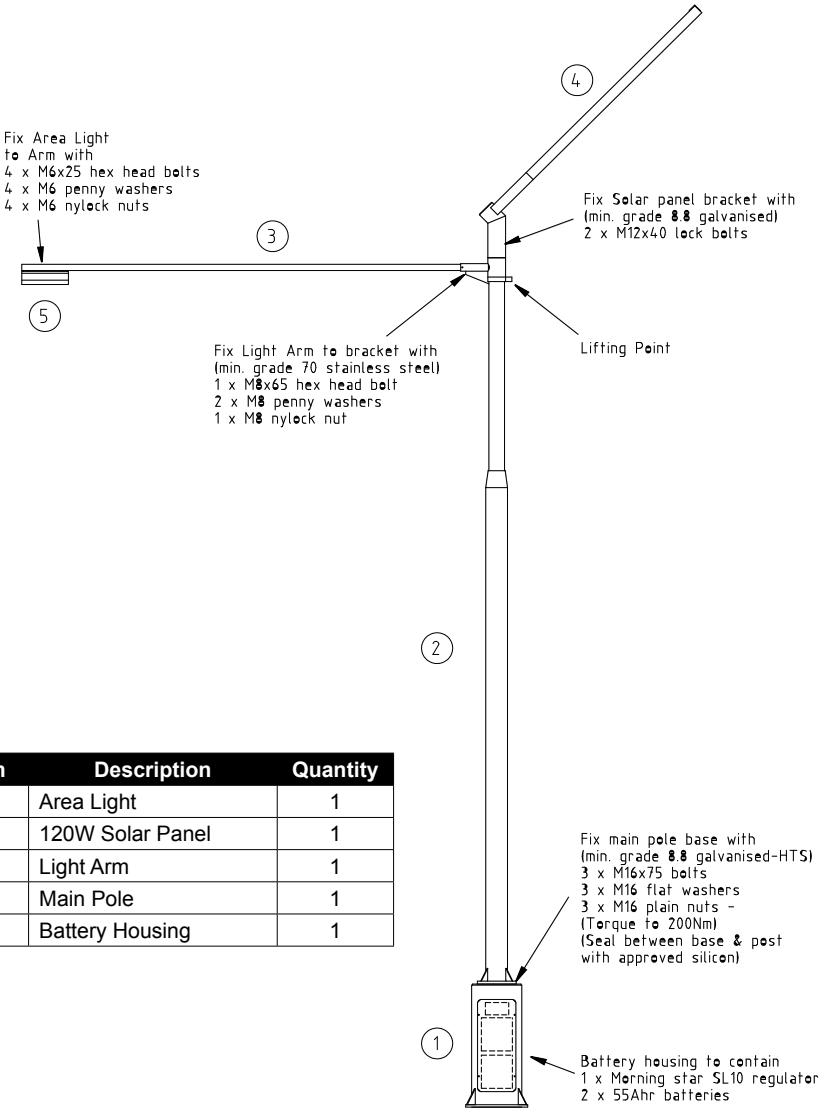


Fig 4. Lamp Post Installation, Region A

Product Components

Unpack your area light and check the contents of the package. Verify that all components and hardware have been received.

Please contact your Avlite office if any components are missing or damaged.


4
Fix Area Light
to Arm with
4 x M6x25 hex head bolts
4 x M6 penny washers
4 x M6 nylock nuts
3
Fix Solar panel bracket with
(min. grade 8.8 galvanised)
2 x M12x40 lock bolts
5
Fix Light Arm to bracket with
(min. grade 70 stainless steel)
1 x M8x65 hex head bolt
2 x M8 penny washers
1 x M8 nylock nut
Lifting Point
2
Fix main pole base with
(min. grade 8.8 galvanised-HTS)
3 x M16x75 bolts
3 x M16 flat washers
3 x M16 plain nuts -
(Torque to 200Nm)
(Seal between base & post
with approved silicon)
1
Battery housing to contain
1 x Morning star SL10 regulator
2 x 55Ahr batteries

Item	Description	Quantity
1	Area Light	1
2	120W Solar Panel	1
3	Light Arm	1
4	Main Pole	1
5	Battery Housing	1

Fig 5. AV-SAL-01 Solar LED Area Light Components & Lamp Post Assembly

Assembly

Before installing the area light, please read the section on wind loading and ensure that the installation will be suitable.

Before installing the foundations, please consider the layout of the light arm location, solar panel direction required and the mounting foot print of the battery housing.

Ensure that the prepared foundations are suitable to withstand the wind loading and comply with local laws.

Bolt the area light pole to the battery housing. Too stop water from entering the battery box, place a thick bead of silicone around the mounting flange of the area light pole and the bolt holes during assembly. Fit the pole up to the battery housing and fix together using the 3 x M16 x 75 bolts. Tighten the three mounting bolts to 200nm.

Fit the solar array on to the top of the light pole. Feed the solar cable down through the centre of the area light pole and into the battery housing. This will need to be done during the installation of the solar array. Tighten the M10 locking screws, to fix the solar array into place.

Fit the light head to the light arm if not already fitted, using the 4 x M6 x 25 hex head bolts. Feed the head of the bolt into the mounting channel on the base of the area light head. Locate the 4 bolts through the mounting plates on the area light arm and fix into place with the 4 x M6 washers and M6 Nylock nuts.

Feed the light cable into and through the light arm. Position the light arm up to it's mounting location on the area light pole and continue to feed the cable into the area light pole and down into the battery housing.

Fit the light arm into location and fix into place with a M6 x 65mm hex head bolt, M6 washers and M6 Nylock nut.

Using suitable lifting equipment, install the area light on to its foundation and fix into place.

To complete the installation, follow the directions in the 'Regulator Connection & Operation' section of this manual.

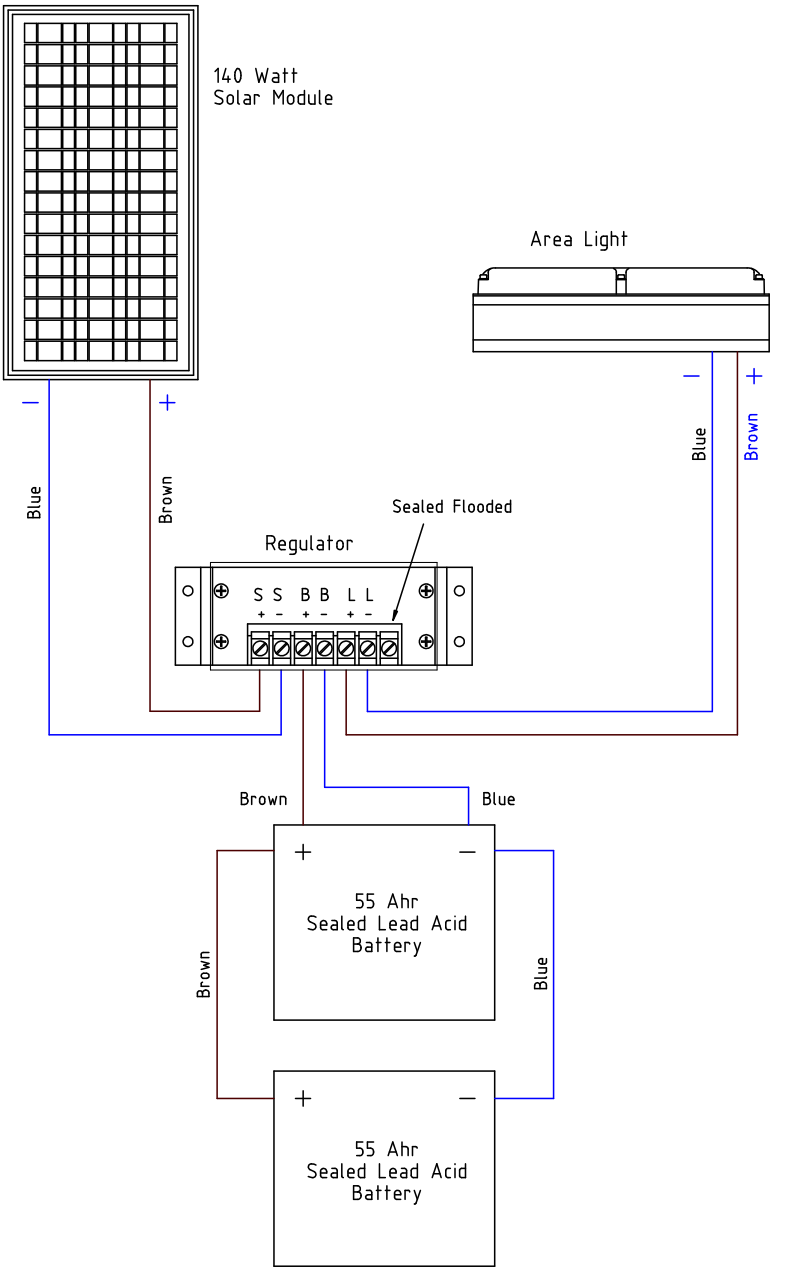


Fig 6. Solar Area Light Electrical Wiring Diagram

Activation

Charging the Battery

New lights should be left in the sun for 1-2 days to ensure battery is charged before placing in service. Please note, light will re-charge even when toggle switch is turned to 'OFF' position.

Preferred Installation Location

For best light performance, ensure solar modules are not covered and are in clear view of the sky with no shadows.

Light Operation

1. The AV-SAL-01 will be preset at the factory to steady-on.
2. The AV-SAL-01 uses an ambient light sensor to measure the light levels. When the light level falls below a set threshold the microprocessor will activate the light.
3. When the light level rises over the threshold, the microprocessor will turn the light off.

Regulator Connection & Operation

Fit the Morning Star SS10 regulator into the carrier on the back wall.

Fit the two 55 amp hour battery's in to the shelves in the battery housing.

Important:
The regulator has a connection sequence that must be followed. Please ensure the regulator is connected in the following sequence.

1. Connect Battery Negative cable to the battery negative terminals on the batteries
2. Connect the Battery Positive cable to the battery positive terminals on the batteries
3. Connect the Solar Negative wire from the solar panel to the regulator
4. Connect the Solar Positive wire from the solar panel to the regulator
5. Connect the Negative Wire from the light head to the load (light) Negative terminal on the regulator
6. Connect the Positive Wire from the light head to the load (light) Positive terminal on the regulator

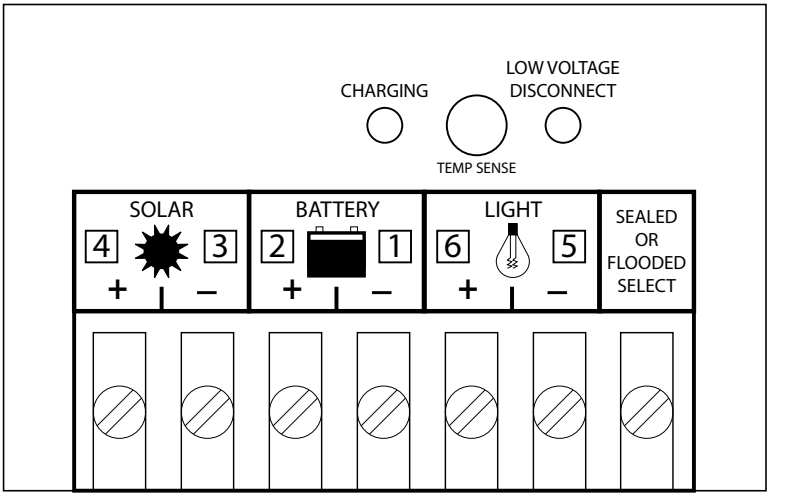


Fig 7. Regulator Diagram

Cover the light head with a dark towel or jacket. Allow a 60 seconds of continuous darkness for the light to activate.

When the installation is complete, fit the battery housing cover, using 6 x M8 x 25 SHCS.

Maintenance & Servicing

Designed to be maintenance free, the AV-SAL-01 requires minimal attention, though the following maintenance and servicing information is provided to help ensure the life of your Avlite product.

1. Cleaning Solar Panels - occasional cleaning of the solar panels may be required. Using a cloth and warm soapy water, wipe off any foreign matter before rinsing the panels with fresh water.
2. Battery Check - inspection of batteries should be performed every three years (minimum) to ensure that the charger, battery and ancillary electronics are functioning correctly. Using a voltage meter, check that the battery voltage is at least 12.5 volts, and ensure all terminals are clear of foreign matter.

Replacing the battery

1. Remove the connectors from the battery.
2. Follow the instructions in the ‘Regulator Connection & Assembly” section of this manual.

Trouble Shooting

Problem	Remedy
Light will not activate.	• Ensure light is in darkness. • Wait at least 60 seconds for the program to initialise in darkness. • Ensure battery terminals are properly connected. • Ensure battery voltage is above 12.5volts.
Light will not operate for the entire night.	• Expose light to direct sunlight and monitor operation for several days. Avlite products typically require 1.5 hours of direct sunlight per day to retain full autonomy. From a discharged state, the light may require several days of operational conditions to 'cycle' up to full autonomy. • Reducing the light output intensity or duty cycle (flash code) will reduce current draw on the battery. • Ensure solar module is clean and not covered by shading during the day.

Notes

Avlite Light Warranty V1.1

Activating the Warranty

Upon purchase, the Avlite Systems warranty must be activated for recognition of future claims. To do this you have two (2) options:

1. **Postal Registration**
   Please complete the Avlite Systems Warranty Registration Card and return to Avlite within 30 days of your purchase.
2. **Online Registration**
   Please complete the Online Registration Form at; **www.avlite.com**

Avlite Systems will repair or replace your lantern in the event of electronic failure for a period of up to three years from the date of purchase.

The unit must be returned to Avlite freight prepaid.

Warranty Terms

1. Avlite Systems warrants that any Avlite aviation products fitted with telemetry equipment including but not limited to AIS, GSM, GPS or RF ("Telemetry Products") will be free from defective materials and workmanship under normal and intended use, subject to the conditions hereinafter set forth, for a period of twelve (12) months from the date of purchase by the original purchaser.
2. Avlite Systems warrants that any rotationally-moulded products ("Roto-Moulded Products") and accessory products ("Accessory Products") will be free from defective materials and workmanship under normal and intended use, subject to the conditions hereinafter set forth, for a period of twelve (12) months from the date of purchase by the original purchaser.
3. Avlite Systems warrants that any Avlite aviation products other than the Telemetry Products, Roto-Moulded Products and Accessory Products ("Avlite Products") will be free from defective materials and workmanship under normal and intended use, subject to the conditions hereinafter set forth, for a period of three (3) years from the date of purchase by the original purchaser.
4. Avlite Systems will repair or replace, at Avlite's sole discretion, any Telemetry Products, Roto-Moulded Products, Accessory Products or Avlite Products found to be defective in material and workmanship in the relevant warranty period so long as the Warranty Conditions (set out below) are satisfied.
5. If any Telemetry Products or Avlite Products are fitted with a rechargeable battery, Avlite Systems warrants the battery will be free from defect for a period of one (1) year when used within original manufacturer's specifications and instructions.

Warranty Conditions

This Warranty is subject to the following conditions and limitations;

1. The warranty is applicable to lanterns manufactured from 1/1/2009.
2. The warranty is void and inapplicable if:
   a. the product has been used or handled other than in accordance with the instructions in the owner's manual and any other information or instructions provided to the customer by Avlite;
   b. the product has been deliberately abused, or misused, damaged by accident or neglect or in being transported; or
   c. the defect is due to the product being repaired or tampered with by anyone other than Avlite or authorised Avlite repair personnel.
3. The customer must give Avlite Systems notice of any defect with the product within 30 days of the customer becoming aware of the defect.
4. Rechargeable batteries have a limited number of charge cycles and may eventually need to be replaced. Typical battery replacement period is 3-4 years. Long term exposure to high temperatures will shorten the battery life. Batteries used or stored in a manner inconsistent with the manufacturer's specifications and instructions shall not be covered by this warranty.

5. No modifications to the original specifications determined by Avlite shall be made without written approval of Avlite Systems.
6. Avlite lights can be fitted with 3rd party power supplies and accessories but are covered by the 3rd party warranty terms and conditions.
7. The product must be packed and returned to Avlite Systems by the customer at his or her sole expense. Avlite Systems will pay return freight of its choice. A returned product must be accompanied by a written description of the defect and a photocopy of the original purchase receipt. This receipt must clearly list model and serial number, the date of purchase, the name and address of the purchaser and authorised dealer and the price paid by the purchaser. On receipt of the product, Avlite Systems will assess the product and advise the customer as to whether the claimed defect is covered by this warranty.
8. Avlite Systems reserves the right to modify the design of any product without obligation to purchasers of previously manufactured products and to change the prices or specifications of any product without notice or obligation to any person.
9. Input voltage shall not exceed those recommended for the product.
10. Warranty does not cover damage caused by the incorrect replacement of battery in solar lantern models.
11. This warranty does not cover any damage or defect caused to any product as a result of water flooding or any other acts of nature.
12. There are no representations or warranties of any kind by Avlite or any other person who is an agent, employee, or other representative or affiliate of Avlite, express or implied, with respect to condition of performance of any product, their merchantability, or fitness for a particular purpose, or with respect to any other matter relating to any products.

Limitation of Liability

To the extent permitted by section 68A of the Trade Practices Act 1974 (Cth), the liability of Avlite Systems under this Warranty will be, at the option of Avlite Systems, limited to either the replacement or repair of any defective product covered by this Warranty. Avlite Systems will not be liable to Buyer for consequential damages resulting from any defect or deficiencies in accepted items.

Limited to Original Purchaser

This Warranty is for the sole benefit of the original purchaser of the covered product and shall not extend to any subsequent purchaser of the product.

Miscellaneous

Apart from the specific warranties provided under this warranty, all other express or implied warranties relating to the above product is hereby excluded to the fullest extent allowable under law. The warranty does not extend to any lost profits, loss of good will or any indirect, incidental or consequential costs or damages or losses incurred by the purchaser as a result of any defect with the covered product.

Warrantor

Avlite Systems has authorised distribution in many countries of the world. In each country, the authorised importing distributor has accepted the responsibility for warranty of products sold by distributor. Warranty service should normally be obtained from the importing distributor from whom you purchased your product. In the event of service required beyond the capability of the importer, Avlite Systems will fulfil the conditions of the warranty. Such product must be returned at the owner's expense to the Avlite Systems factory, together with a photocopy of the bill of sale for that product, a detailed description of the problem, and any information necessary for return shipment.

Information in this manual is subject to change without notice and does not represent a commitment on the part of the vendor.
Sealite products are subject to certain Australian and worldwide patent applications.

Other Avlite Products Available

Solar Aviation Lighting

**Radio Controlled &
PALC Systems (FCC Compliant)**

**Obstruction Lighting
(LIOL A & LIOL B)**

**Airfield Markers
& Accessories**

Typical Applications

- Temporary & permanent airfield lighting
- Remote, emergency & defence airfield lighting
- Barricade, hazard & perimeter lighting
- Obstruction Lighting

For a complete list of product compliances including ICAO & FAA, please contact Avlite today

Area & Sign Lighting

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